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TRANSPORTING CARRIERS OF SEALED SAMPLE TUBES AND MIXING THE  
SAMPLE

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(56) Prior Art Documents  
US 4120662  
US 3575692  
US 3625485

(57) Claim

1. A method for transporting carriers of sealed sample tubes, mixing the sample material in the tubes and piercing the tube seals for feeding of the sample material into a sample analyzer, each carrier holding a plurality of the sample tubes, said method characterized by the steps of: advancing each of a series of the carriers along a longitudinal path from an input location to an output location, there being a seal piercing station between those locations; rocking the path around its longitudinal axis such that the sample tubes undergo a plurality of partial inversions during which the sealed end of each tube is rocked above and below the other end of the tube; said rocking being accomplished a plurality of times and in a sufficient manner for the sample material to be adequately mixed, but not damaged, just prior to seal piercing; and stopping said carrier advancing at the seal piercing station for a time duration sufficient for seal piercing and sample feeding into the analyzer; said rocking being accomplished during at least one of said advancing and stopping steps.

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12. An apparatus for transporting carriers of sealed sample tubes, mixing the sample material in the tubes and piercing the tube seals for feeding the sample to an analyzer, each carrier capable of holding a plurality of the sample tubes, said apparatus characterized by: a table having a longitudinal axis, said table being constructed and arranged to be rocked around its longitudinal axis, one longitudinal end of said table being its carrier input end and the other longitudinal end being its carrier output end; carrier conveyor means supported by said table and constructed and arranged for conveying said tube carriers over the surface of said table from proximate said input end to proximate said output end, said conveyor means being rocked whenever said table is rocked and thereby rocking any carriers thereon and the sample tubes held therein; tube seal piercing means mounted adjacent to said table at a location between its said input and output ends; drive means for rocking said table and advancing said conveyor means, said drive means being constructed and arranged such that the sample tubes in a carrier on the conveyor will undergo a plurality of partial inversions during which the sealed end of each tube is rocked above and below the other end of the tube for sample mixing, said drive means further being constructed and arranged to advance a carrier on said conveyor means to bring the sample tubes into substantial alignment with said seal piercing means and then for stopping said conveyor means for a time duration sufficient for seal piercing, said drive means also being constructed and arranged to effect the table rocking during at least one of the conveyor advancing and conveyor stopping times.